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American Society of Dentistry for Children

Annual Meeting

WILLARD HOTEL—WASHINGTON, D. C.

October 12–14, 1951

Friday—October 12th—8 P.M.

Executive Meeting

Saturday—October 13th—9:30–12 A.M.

Executive Council and State Delegates Meeting

Saturday—October 13th—1:30–4 P.M.

Scientific Section

"ORAL HABITS IN CHILDREN"

Dr. Russell Dixon, Dean of Howard University, School of Dentistry—*Moderator*

Dr. W. Krogman—"Anthropological Appraisal of Dental Development"

Dr. M. Massler—"Significance of Oral Habits and Effects on the Developing Dentition"

Dr. I. N. Kugelmass—"The Pediatric Approach to Oral Habits in Children"

Dr. J. A. Salzman—"Orthodontic Approach to the Interception and Treatment of Oral Habits in Children"

Sunday—October 14th—10–12:30

Table Clinics

Sunday—October 14th—2–5:30 P.M.

General Business Session and Election of Officers

Sunday—October 14th—7 P.M.

Dinner and Panel Discussion on

"COMMUNITY DENTAL PROGRAM PLANNING FOR CHILDREN"

Dr. Clemen C. Rault, Dean of Georgetown University, School of Dentistry—*Moderator*

Dr. A. Gruebbel—"The Role of the Dental Society in Community Health Planning for Children"

Dr. J. Pelton—"The Role of U. S. Public Health Service in Community Dental Health Planning for Children"

Dr. L. Snedeker—"The Role of the Hospital in Community Dental Health Planning for Children"

Dr. J. Wisan—"The Role of the Community in Dental Health Planning for Children"

Wives, Dental Hygienists and Assistants are cordially invited to attend the Dinner and Discussion

The Effect of Topically Applied Fluorides in Dental Caries Experience on Children Residing in Fluoride Areas

ROBERT A. DOWNS, D.D.S., M.S.P.H., AND WALTER J. PELTON, D.D.S., M.S.P.H.

Editor's note:

Bob Downs, co-author of this article on fluoridization of teeth, is a member of the Council on Dental Health of the A.D.A., and Dental Director of the State Health Department of Colorado.

Jack Pelton is a member of the U.S. P.H.S., currently directing one division of its activities from Washington, D. C.

In this article, we think you'll find one viewpoint on a question often raised. You may be sure that it is well written, and with sound factual evidence to substantiate the statements presented, for both of the men received their M.P.H. from the University of Michigan, where Eagle Eye Easlick proof reads with a vengeance!!

A. E. S.

Previously reported studies by Knutson and others have been concerned with the over-all effect of topically applied fluorides on dental caries experience in the permanent teeth of children who resided in non-fluoride areas (1–8). Up to the present time, the data indicate that a series of four applications of two per cent sodium fluoride over a short period of time will reduce the incidence of new caries by forty per cent in children who have a relatively high decay rate. The question arose in the Western States whether topical applications of sodium fluoride are as effective in children who reside in fluoride areas and have a relatively low decay rate as they are in non-fluoride areas where decay rates are high. Furthermore, it was desirable to know whether children reared in optimal fluoride areas, having one part per million fluorine in the water supply, would receive less benefit from topical applications of sodium fluoride than the children who resided in a community having less, but some, fluorine in its water supply. It seems unwise in the interest of sound public health practice to encourage either the public or the dental profession to use this method of caries control routinely in fluoride areas without having more specific research and information on the matter.

Accordingly, Sterling, Colorado, having four-tenths parts per million fluorine in its public water supply, and Cheyenne, Wyoming having one part per million fluorine in its public water supply, were selected as test areas. Furthermore, previous dental examinations indicated that the children in these communities had a relatively low dental caries attack rate.

METHOD OF STUDY

In Sterling, the water histories of the school children were examined and about 300 who showed evidence of having resided continuously in the community since birth were selected. Dental examinations of the children were performed in suitable school rooms using a portable and adjustable dental chair, natural light

supplemented by a portable light, when necessary, and using new mouth mirrors and sharp explorers. The findings for each individual tooth and surface were recorded on a form according to accepted technics (9). After the examination the children were recalled and given four applications of sodium fluoride in the manner advocated by Knutson (10). The upper and lower teeth on the left quadrants of the mouth were treated and the opposite quadrants were used as controls. The right quadrants were used as controls as previously.

The age range of the children in Sterling was from six years to eighteen years. In Cheyenne the age range was from twelve to sixteen years at the beginning of the study. In January 1950, re-examinations of the Sterling children were made under the same physical conditions and the data recorded in the same manner as in the intial examinations. In February 1950 re-examinations of the

TABLE I

Dental caries experience during a one-year period ending in February 1950, for the permanent teeth in the fluoride-treated-and-untreated quadrants of mouths of 285 Sterling, Colorado and 253 Cheyenne, Wyoming children

	NUMBER OF NON-CARIOUS TEETH AS OF OCT 1948—STERLING; JAN 1949—CHEYENNE	NUMBER OF NEW CARIOUS TEETH JAN 1950—STERLING; FEB 1950—CHEYENNE	CARIOUS SURFACES IN NEWLY CARIOUS TEETH	NEW CARIOUS SURFACES IN PREVIOUSLY CARIOUS TEETH	TOTAL NEW CARIOUS SURFACES
Sterling, Colorado 0.4 ppm F					
Treated (left)	1754	112	131	30	161
Untreated (right)	1748	105	120	26	146
Cheyenne, Wyoming 1.0 ppm F					
Treated (left)	2966	88	102	28	130
Untreated (right)	2948	103	112	34	146
Total of study cities					
Treated (left)	4719	200	233	58	291
Untreated (right)	4696	208	232	60	292

The examinations were made in October of 1948 and the series of four topical applications were completed in the next few weeks.

In Cheyenne during January 1949 approximately 300 ninth grade children were selected according to their water histories and as in Sterling, were examined and the data recorded. The left quadrants of the mouths of the Cheyenne children were treated in January 1949 by the topical fluoride team assigned to the Wyoming State Health Department. The Cheyenne children were done under similar circumstances.

FINDINGS

All of the differences observed are well within the limits of chance variation and might have been seen had the children been given no treatment at all.

Table I shows the data for the treated and untreated quadrants of the permanent dentition that were present in the mouths of 285 Sterling, Colorado and 253 Cheyenne, Wyoming children. The

data shows that of 1,754 caries-free teeth in the mouths of the Sterling children in the treated quadrants, there were 112 new carious teeth at the close of the study period. This represents 6.4 per cent of the total number of non-carious teeth in the treated quadrants that became carious during the study period. The corresponding data of the untreated quadrants in the Sterling, Colorado children's mouths is 105 divided by 1748, or 6.0 per cent. It is seen from these two percentage figures that the treated quadrants had slightly more teeth become carious during the study period than the untreated quadrants. The total number of carious surfaces which became involved during the study period (161 compared to 146) also reflects this finding.

Of 2,966 caries-free teeth in the treated quadrants of the permanent teeth of the children in Cheyenne, Wyoming at the beginning of the study, 83 became carious during the experimental period. The 83 teeth represents three per cent of the total number of caries-free teeth which became carious during the study period. The untreated quadrants showed that 103 teeth became carious out of 2,948 caries-free teeth at the beginning of the study, or 3.5 per cent of the total number of teeth exposed to the risk of becoming carious.

The total number of new carious surfaces in the teeth of the Cheyenne children that became carious during the study period and the new surfaces that became carious in previously carious teeth, are 130 and 146. The data concerning new carious teeth and new carious surfaces in the treated and untreated quadrants support each other.

DISCUSSION

It should be obvious from this data that no reduction in the incidence of new caries in the permanent teeth of children residing in fluoride areas can be predicted following the application of sodium fluoride. This information should be regarded as inconclusive until further work is done with larger samples.

As a sidelight to these studies, it is interesting to note that in Sterling, Colorado, the teeth decayed at the rate of .76 teeth per child per study period as compared to .75 teeth per child per year in Cheyenne. Although the study period was two months longer in Sterling than in Cheyenne, this and other data (11) suggest that the dental caries prevalence in communities having approximately one-half part per million fluorine per million parts of water is practically as low as in the communites having the heretofore regarded optimal amount of one part per million fluorine. The thought here is that the critical point at which fluorine is effective in reducing dental caries may be a great deal less than reported by Dean and his study of thirteen cities in four states (12).

SUMMARY

This study casts doubt as to the efficacy of topical applications of two per cent sodium fluoride applied to the teeth of children born and reared in fluoride areas.

In the light of this study it would appear unsound, from either a monetary or personnel standpoint, to foster the routine use of topical fluoride treatments as a public health measure in cities having a concentration of fluorine in their public water of 0.4 ppm. or more. At the present time it appears reasonable to encourage the use of topical applications of sodium fluoride on the teeth of those children residing in a fluoride area but who have calcified their teeth on fluoride deficient waters.

It is believed, however, that before final decisions are made regarding the matter that further studies in fluoride areas, using a larger number of children, should be undertaken to determine whether or not these findings are confirmed.

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A Rational Approach to Routine Cavity Medication

WESLEY OSBORN YOUNG, A.B., D.M.D.
Nampa, Idaho

Editor's note:

This article on cavity sterilization was prepared by Wes Young during his graduate work at the University of Michigan. It represents a lot of work and reading of the literature on the subject and although the answer to the question "Shall we sterilize the cavity preparation?" will still be debated, you who read this article will be in a better position to evaluate the opinions expressed.

A. E. S.

If dentistry, and in particular dentistry for children, is to continue to develop from a mechanical art to a biological science it is important that its technics be based on rational thinking and carefully controlled experimentation. Instead, it would seem at times, that the profession has been directed by superficial thinking and the teaching forceful but unscientific personalities.

The lack of a critical attitude toward time honored technics has been most obvious in cavity medication. Sixty years ago W. D. Miller (5) wrote, "Many years ago a well-known teacher of dentistry remarked to me that he always bathed a cavity with creosote before filling; just why he could not tell, but he had a feeling that it might have a beneficial action, at least it could do no harm." Dentistry, of course, has made considerable progress since these words were written in 1891, yet it is doubtful if many practitioners today have achieved a more rational basis for the technic which they have selected, in the medication of cavities.

To develop a scientific routine it appears essential to explore and answer certain questions. It is important to determine whether bacteria remain in sound dentin after shallow cavities have been prepared. If bacteria do remain in the dentin and are sealed off by a restoration, the scientific dentist should find out if the bacteria are capable of producing further damage. The literature on cavity medication will be reviewed and these factors of the problem of treatment will be discussed in this paper.

An examination of the scientific literature is somewhat confusing. Various methods of treating cavities have been advocated, some of them in direct contradiction. The major interest appears to have been in the management of large carious lesions and nearly exposed pulps. Very few investigations have been completed to determine scientific medication during routine operative procedures to prepare shallow cavities, or cavities of medium depth for fillings. The management of these cavities is an important consideration if the goal of adequate care for children is attained.

Bacterial Invasion of Sound Dentin

Before a final determination of the requirements of cavity medication, it has been suggested that the presence or ab-

sence of remaining microorganisms in the dentin of the prepared cavity be established. Some controversy exists concerning their presence, since there is evidence both for and against the conclusion that the invasion of bacteria precedes decalcification.

Miller (6) observed that longitudinal ground sections of carious teeth stained with fuchsine examined under a very low power microscope, showed large tracts of decayed tissue near the inner margin of the carious lesion which remained uncolored. The conclusion was drawn "the softening (decalcification) of the dentin extends further than the invasion of the microorganisms." It was observed that the bacteria traveled more rapidly in the direction of the dentinal tubules than at right angles to them so that "while the microorganisms almost or do keep up with the softening in the direction toward the pulp, they fall considerably behind in the lateral direction" (Fig. 1).

Miller stated very definitely that, "The action of acids always precedes the invasion of bacteria." At the same time he observed that bacteria could penetrate into normal dentin for it was noted that, "Under high power we also often observe that a small number of bacteria, outposts, as it were, have penetrated into the normal dentin without, however, producing any visible changes."

Canby and Bernier (2) examined thirty-six carious permanent teeth that were vital and considered suitable for restoration. The teeth were isolated, sterilized and opened with sterile instruments. After the soft spongy debris was removed a pledget of sterile cotton, slightly moistened with ninety-five per cent phenol was applied to the exposed surfaces of the cavity, followed by alcohol. The superficial decay was then removed and cultured. The surface of the deeper decayed area was again treated with phenol and alcohol, and another specimen taken.

The specimens were cultured in a veal infusion-brain broth. Eight per cent (3) of the cultures taken from the superficial layers of carious dentin were sterile, while thirty-six and one half per cent (13) of the cultures taken from the deep layers of carious dentin were negative bacteriologically. Canby and Bernier concluded that "in many cases, a sterile area may exist between the deep carious mass and the pulpal floor. . . ."

FIG. 1. Undermining decay from Miller. a. Zone of softened noninfected dentine

Dorfman, Stephan and Muntz (3) made bacteriological cultures from different levels in various lesions, using two approaches: (1) from the carious dentin into the sound, and (2) from the sound dentin into the carious.

With the first method, overhanging enamel was removed with chisels so as to expose the entire area of carious dentin. Starting on the carious surface, a series of samples of carious dentin were removed by cutting successive levels with sterile knives. The culture medium was inoculated with samples taken from the superficial layer, the middle layer, the deep layer, the partially decalcified layer adjacent to sound dentin and the sound dentin.

With the second method, the carious material was approached from a sound surface that had been cleaned, washed

with zephiran 1:1000, and freed of enamel by grinding with a sterile stone so as to expose a sterile surface of sound dentin. A hole was made into the exposed sound dentin with a sterile hand-operated drill and a control culture taken. The hole was then extended into the carious dentin and samples for culture were taken at successive levels of the carious material. Each sample was taken separately with a sterile instrument and inoculated into a tube of culture medium.

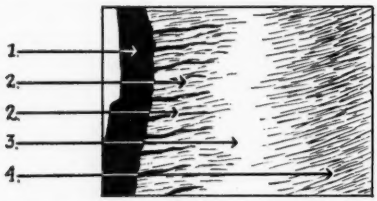

FIG. 2. Caries of dentin, stained ground section from Kronfeld. 1. Structureless, decomposed dentin at the bottom of the carious cavity. 2. Dentinal tubules invaded by microorganisms. 3. Zone of transparent dentin. 4. Normal dentinal tubules.

Of the twenty teeth where samples of dentin were taken from the carious dentin to sound dentin, only one tooth gave a positive culture from the sound dentin. None of the seventy teeth where the samples were taken from the sound dentin to the carious surface yielded a positive culture from sound dentin. The investigators concluded, "It is clear that the decalcification has preceded the bacterial invasion, and there is usually a layer of sterile decalcified dentin overlying the sound dentin."

These conclusions are not accepted by all investigators. Kronfield (4), in his "Histopathology of the Teeth" says, "The first step in caries of dentin is the invasion of the tubules by microorganisms; next follows the decalcification of the surrounding matrix by the action of these microorganisms." This statement was made on the basis of microscopic examinations of stained ground sections of carious dentin. He noted five distinct zones in the study of such sections:

1. "A zone of complete decalcification of the walls of the tubules and of the matrix with decomposition of the decalcified matrix."

2. "A zone of incipient decalcification of the dentin, the result of the action of microorganisms that have invaded the tubules."

3. "A zone of obliteration of the tubules by calcification of Tomes fibers."

4. "A zone of fatty degeneration and the beginning of precipitation of calcium droplets in the protoplasm of Tomes' fibers.

5. "A zone of normal dentin with apparently undisturbed dentinal tubules" (Fig. 2).

Kronfeld, like Miller, noted that there are a few tubules that contain microorganisms in a level far ahead of actual decalcification and decay. "These 'pioneer organisms' as they are sometimes called, are no doubt left in the tooth after all the decayed and infected dentin has been completely excavated during cavity preparation."

In 1940 Seltzer (8) cultured 234 occlusal cavities in children's teeth after excavation to a normal preparation depth. He obtained 30 positive cultures out of 72 shallow cavities, 95 positive cultures out of 113 medium cavities, and forty-six positive cultures out of 49 deep cavities. He concluded that "the chances for mechanically eliminating all bacteria from a shallow cavity are greater than fifty per cent."

Zander (9) examined microscopically ten cavities prepared in teeth with caries that did not involve the pulp. The cavi-

ties were excavated with spoons until nothing but hard dentin was left which was unpenetrable to a sharp explorer. Immediately after completion of the cavity the teeth were extracted, placed in fixing solution, decalcified and imbedded in colloidin. Sections were made from these specimens six and eight microns thick and stained with a hematoxylin-gram stain.

In studying the sections prepared from this material, four of the ten cavities contained microorganisms in the hard dentin of the cavity floor. Their penetration into the dentinal tubules varied from 0.08 mm. to 1.2 mm.; their distance from the pulp varied from 0.24 mm. to 1.9 mm.

A possible explanation for the two conclusions regarding bacterial invasion and decalcification is presented by Zander (10). He suggested that "there is a microscopic difference in the course of caries. In the acute stage, so often seen in children's mouths, there is probably a wide area of softened dentin the development of which precedes the actual invasion of the tubules by bacteria. In contrast, there is the chronic type of caries, usually found in older persons, in which the invasion of the tubules is far in advance of the softening."

Fate of Bacteria Sealed in Cavities

In 1941 Seltzer (7) reported a bacteriologic study of 93 teeth (in vivo) in which all clinical evidence of decay had been removed and cultures had been taken from the dentin three times, immediately after preparation, two weeks later, and one year after the initial culture. The medicaments were tested by sealing them under sterile gutta percha and amalgam for one year (Fig. 3). To provide a control for the experiment twelve teeth were sealed without any type of medication. Of the twelve teeth in which no sterilizing agent was used, ten (83 per cent) yielded positive cultures at the end of one year.

Besic (1) followed ten teeth bacteriologically for a year to determine how long the various strains of bacteria would remain alive when sealed under a restoration (in vivo). In most of the preparations a small amount of decayed dentin was allowed to remain in the floor of the cavity. No medication was used in any of the teeth studied. Of the ten teeth studied,

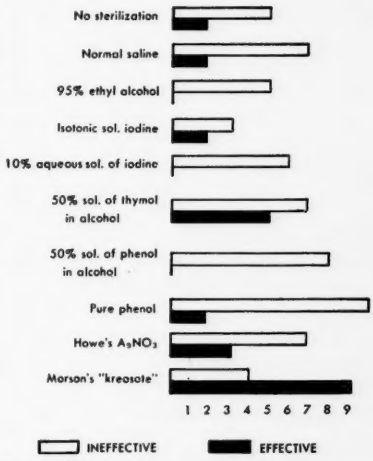

FIG. 3. Efficacy of treatment with various antiseptics (from Seltzer)

streptococci were found in eight, lactobacilli in five, and staphylococci in two. The lactobacilli died out some time between two and ten months; the staphylococci remained alive for at least a year; and the streptococci, which were the most prevalant and resistant organisms, remained alive in one-third (3) of the teeth after being sealed for one year. It should be noted, although 30 per cent of the teeth yielded positive cultures after more than one year, that Besic found no

extension of the carious process in the sealed off cavities.

DISCUSSION

It has been pointed out that Miller concluded that the decalcification of the dentin preceded bacterial invasion, while Kronfeld held that the bacterial invasion preceded decalcification. Both conclusions were based upon the microscopic study of ground sections and since the number of sections examined were not indicated and it is not possible to determine the accuracy of sampling or statistical reliability a final determination of fact is not possible from these studies.

It is suggested by Zander that the microscopic advance of bacteria may differ in acute and chronic caries. There is also a possible relationship between the type of organism and the advance of the carious lesion. If it is not certain that caries always progresses in the same manner the study of a limited number of teeth can lead to a serious sampling error. This same error is possible, also, in a large sample unless care is excercised. The various experiments reported in the Table have been summarized from the standpoint of statistical reliability. It should be kept in mind that this ascertains only whether chance, acting alone, has been eliminated at a significant level. It does not indicate such other factors as the accuracy of the mechanics of the experiment or the interpretation, the design of the experiment, or the possible errors of sampling.

The evidence does seem to indicate that bacteria may, at times at least, precede decalcification and be found some distance into sound dentin. On this point Miller and Kronfeld agree. Miller rereferred to these bacteria as "outposts," while Kronfeld termed them "pioneer organisms." Zander found microorganisms in the sound dentin of four out of ten cavities by microscopic examination. Seltzer reported positive bacteriologic cultures from the sound dentin of 41.6 per cent of seventy-two shallow cavities.

It also seems possible to conclude that in other instances the decalcification precedes the bacterial invasion and there is an area of sterile decalcified dentin at the margin of the carious lesion. Seltzer stated that this was true in more than 50 per cent of the teeth he studied. Zander did not find any bacteria in six of the ten cavities that he examined microscopically. Dorfman, Stephan, and Muntz reported that 95–100 per cent of the teeth of which they took cultures from the sound dentin did not show bacteria present.

It is impossible to draw any conclusions about the fate of bacteria sealed under a restoration, except to suggest that it is possible that in some instances bacteria are unable to do any further damage when sealed off from the mouth. The investigations of Seltzer and Besic give some indications of this fact. Both Miller and Kronfeld indicated that the microorganisms that they noted in the dentin had not produced any visible damage.

As long as it is not possible to be certain that the dentin will be made sterile by cavity preparation, and that bacteria are not capable of producing further damage it would seem advisable to use cavity medication that will destroy these bacteria without damage to the pulp.

It seems evident that further investigation is needed to outline a rational approach to cavity medication. It is necessary to learn more about caries in dentin so that we can determine under what conditions sound dentin will be sterile, and under what conditions it will be infected. The importance of bacterial con-

INVESTIGATOR	TYPE OF INVESTIGATION	NUMBER OF TEETH EXAMINED	RESULTS REPORTED	STANDARD ERROR OF PERCENT	RANGE OF 95% STATISTICAL CONFIDENCE	STATISTICAL SIGNIFICANCE
Miller	Microscopic examination of ground sections*					No
Canby and Bernier	Cultures from superficial layer of carious dentin	3	8.3% negative	4.0%	.3–16.3%	No
	Cultures from deep layer of carious dentin	3	36.5% negative	8.0%	20.5–52.5%	Yes
Dorfman, Stephan, and Muntz	Cultures of dentin taken from sound dentin to carious dentin. Cultures reported from sound dentin	7	100% negative†			
	Cultures of dentin taken from carious surface to sound dentin Cultures reported from sound dentin	20	95% negative	4.8%	85.4–104.6%	Yes
Kronfeld	Microscopic examination of ground sections*					No
Seltzer	Cultures from sound dentin of shallow cavity	72	41.6% positive	5.8%	30.0–53.2%	Yes
	Cultures from sound dentin of medium cavity	113	84% positive	3.4%	77.2–90.8%	Yes
	Cultures from sound dentin of deep cavity	49	93% positive	3.6%	85.8–100.2%	Yes
Zander	Microscopic examination of sections	10	40% positive	15.5%	9.0–71.0%	Yes
Seltzer	Cultures from sound dentin one year after cavity had been prepared and sealed	12	83% positive	10.8%	61.4–104.6%	Yes
Besic	Cultures from sound and infected dentin one year after preparing and sealing cavity	10	30% positive	15%	10–60%	No

* Not reported. It is impossible to make any determination of statistical significance.

† It is not possible to estimate an S.E. from a percentage of 100. It would be impossible to have 100% on this small sample.

tamination from the mouth should be determined. The fate of bacteria sealed under a restoration should be studied so that it is possible to know whether bacteria remaining in sound dentin are capable of producing further damage.

SUMMARY

In an attempt to outline a rational approach to cavity medication the pertinent literature on the status of the dentin after cavity preparation has been reviewed. It has been pointed out that caries of dentin does not always progress in the same manner so that sound dentin is sterile in some instances and infected in others. It was indicated that the fate of bacteria sealed under a restoration is not known, but there is a possibility that in some instances they are unable to produce further damage. The necessity of further investigation to determine the status of the dentin after cavity preparation and the placing of a restoration was indicated. Until the fate of bacteria sealed in cavities is understood it is advisable to continue the routine sterilization of all cavities.

CONCLUSIONS

1. Caries in dentin does not always progress in the same manner.

2. In some instances the sound dentin remaining after cavity preparation is sterile, in others it is infected.

3. The routine sterilization of all cavities is advisable.

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The following is printed in accordance with Constitutional requirements.

Nominating Committee, 1951

John Brauer
Ralph Ireland
W. James Taub, Chairman

Auditing Committee, 1951

Sidney Kohn
Regina David
John Tocchini, Chairman

Unit News

Please send news intended for this department to Mel Noonan, 141 S. Bates St., Birmingham, Michigan.

Ohio

On March 12, 1951, the Cleveland section held a symposium on Endodontics with Dr. T. J. Hill as moderator. The speakers were:

1. Dr. Phillip Burwasser—The Case for Pulpotomy
2. Dr. Albert Knieser—Complete root therapy in one sitting
3. Dr. Paul Sherwood—Indications and contra-indications for root resection and curettage
4. Dr. Kenneth W. Thomas—Healing of periapical tissues without surgery.

On April 23 another fine program was presented on "A Resume of Current Research." The speakers were:

1. Miss White—Newer concepts of organism active in caries
2. Dr. William Sprague—Radio-active tracer investigations
3. Dr. Robert Bruckner—Electric microscopy and the organic contents of enamel. Histo-chemical methods
4. Dr. Sholum Pearlman—Ammoniated dentifrice. The nitro-furans in caries control
5. Dr. Robert Gillis—Fluoride additions in water
6. Dr. Thomas J. Hill—Trends in periodontal research.

Michigan

Dr. Samuel Harris of Detroit made the April meeting a dynamic success by his fine lecture on "Dale Carnegie Techniques in Dentistry for Children." All of the past presidents of the unit were given a small gold gavel charm for appreciation of their guidance during past years.

The results of the annual election were as follows:

President.....C. Roy Brooks
Vice President.....Melvin A. Noonan
Secretary-treasurer
William E. Brown, Jr.

Dr. Harold A. Maxmen was given a vote of thanks for the splendid leadership he gave the unit for the past year.

Western Pennsylvania

At a meeting on May 2, 1951, the Western Pennsylvania Society of Dentistry for Children formally adopted its constitution and by-laws. This constitution was patterned after that of the parent body, the American Society of Dentistry for Children. Each article was discussed at length before it was voted upon by the group.

After adopting the constitution, the group elected officers who will govern until fall, 1952. They are:

President.....C. W. Hagan
President-Elect..Mollie Davidson Foster
Vice-President.....Walter S. Weisz
Secretary-Treasurer...Geraldine M. Fay
Members of executive board
Mervin Binstock
Samuel Carver
E. F. Rapp

The Western Pennsylvania Society of Dentistry for Children plans to hold its fall meeting in conjunction with the Greater Pittsburgh and Pennsylvania State Meeting here in September. All who have joined the Society by that meeting will be charter members.

In the center picture above Harold Maxmen congratulates Roy Brooks as Roy takes over the leadership of our Michigan Unit. The picture to your left shows the speakers' table, while to your right the camera caught Sam Harris in a "Th formation!"

Nebraska

Drs. Sam Weinstein and Earl Lampshire both have written about the fine symposium on "Space Maintenance" which was held at the University of Nebraska on March 12th. The members of the panel were:

1. Dr. Robert Engel—Omaha
2. Dr. E. D. Hibbard—Lincoln
3. Dr. Ralph Ireland—Lincoln
4. Dr. R. C. Rinehart—Scotts Bluff
5. Dr. F. S. Swoboda—Cozad.

On May 15, after hearing Dr. Leonard Fosdick of Northwestern lecture on caries control, the annual election was held. The results follow:

President.....Lyle Furst
Pres.-Elect.....Herbert Jackson
Sec'y-Treas.....Laren Teutsch
Editor.....Sam Weinstein

Minnesota

During the State meeting thirteen M.S.D.C. members presented table clinics. Drs. Walter C. McBride, George Teuscher and Sandy MacGregor were on a panel discussion which lasted 3½ hours.

Officers for the year 1951–1952 are:

President.....Allen D. Peterson
Vice Pres.....Raymond A. Schroeder
Secretary.....Charles D. Simpson
Treasurer.....Clayton Swanson, Jr.

District of Columbia

The D. C. Unit was organized and a constitution and by-laws adopted January 29, 1951. Dr. Hugo Kulstad presented a charter to the organization on February 5th during his visit to Washington.

The 48 members elected the following to office:

President.....Harold Eskew
Vice President.....E. Reed Smith
Sec'y-Treas.....John Fulton

The Unit is looking forward to playing host to the A.S.D.C. during the October meeting.

New York

Reports of the annual session held in Buffalo on May 9, 1951, are all excellent.

Dr. Walter C. McBride of Detroit gave a very inspiring talk on "Economic Management of the Practice of Dentistry for Children." The eight table clinics offered the membership a well balanced program on pedodontics.

Southern California

Dr. Elsie C. Schildwachter informs your editor of the well-rounded programs presented to her Unit. She is very proud of the interest shown in pedodontics. To quote her directly would relate her pleasure. "We have one hundred fifty active members . . . at the present time. It is most gratifying to some of us 'old timers' to see so much interest in dentistry for children . . . . I can remember when less than ten years ago we did well to get fifteen dentists out to a meeting . . ."

* * *

BEAT THE BUZZER!!

If every boy and every girl
Would count each tooth a priceless pearl,
Take time enough from books and play
To brush them briskly twice a day,
Drink milk and keep the diet plain,
Fresh greens and fruits, eggs, meat, whole grain,
Avoid the candy and the sweet,
And eat to live—not live to eat,
They might reduce tooth aches and ills
And spend less time with dentists' drills.

William C. Stillson, D.D.S.
Cleveland, Ohio

Pulp Capping with Zinc Oxide-Eugenol and Calcium Hydroxide: Clinical Studies on 135 Patients*

NORMAN I. TANANBAUM, D.M.D.

INTRODUCTION

Observations on pulp capping were reported by early workers (1, 2). Gardner (3), Foster (4), and Wagner (5) reported failure in capping primary teeth. Gurley (6) reported limited success in treating accidental but not pathological exposures. Brauer (7) and Rosenstein (8, 9), using various materials, reported definite clinical success and considered pulp capping as routine in indicated cases.

Evidence gathered by Teuscher and Zander (10), Zander (11), Restarski (12), Zander and Law (13), and Hartsook (14) in pulp amputation experiments, demonstrated that calcium hydroxide could induce a bridge of dentin and an intact odontoblastic layer over the exposed pulpal stump. Hermann (15), Hess (16), Dillon (17), and Easlick (18) showed a similar reaction in pulp capping. Glass and Zander (19, 20), in experimentally exposed teeth capped with zinc oxide-eugenol and calcium hydroxide, with and without prior phenolization, showed histologically that zinc oxide-eugenol evoked a chronic inflammatory reaction without healing at the site of the exposure and that calcium hydroxide induced the formation of secondary dentin and an intact odontoblastic layer.

The purpose of this paper is to report the experience in private practice with calcium hydroxide and zinc oxide-eugenol as pulp capping agents and to evaluate their effectiveness.

* Read at the Northeastern Dental Society Meeting, Swampscott, Massachusetts, June 5, 1950.

SELECTION OF CASES

The following criteria were employed in the selection of cases:

1. Slight hemorrhage of pulp at point of exposure
2. Sensitivity of the pulp to the touch of an explorer
3. Absence of necrosis (dry or putrescent)
4. Absence of periapical radiographic areas of rarefaction
5. Negative history of chronic disease
6. Negative history of intense, prolonged pain in the tooth involved.

PROCEDURE

Pulp exposures from either caries (pathological) or operative procedure (accidental or mechanical) were treated identically.

1. The tooth was isolated with cotton rolls.
2. A saliva ejector was placed in the mouth.
3. All carious enamel was removed and cavity preparation completed.
4. All carious dentin was excavated either with a spoon excavator or a large round bur (no. 6). This was done without regard to the size of the exposure.
5. The cavity was dried with warm compressed air.

6. The decision to continue with pulp capping was made according to the previously established criteria.

7. (Optional) A phenol-dampened cotton pellet was applied to the exposed area and all debris removed. The preparation was again dried with warm air.

8. (Optional) With cotton pliers, thymol crystals were melted and placed over the exposure.

9. At this point two techniques of pulp capping were used: a. Prior to Jan. 1949, a thin paste of zinc oxide-eugenol was placed without pressure over the exposure. b. After Jan. 1949 a thin paste of calcium hydroxide and tap water was similarly placed.

10. A thin mix of cement was prepared and drawn over the pulp capping material.

11. (Optional) When the cement hardened, it often was necessary to add a thicker-mixed cement base to bring the cavity floor to the desired height.

12. Either a permanent restoration or a temporary filling (zinc oxide-eugenol or cement) was then placed. Where a temporary filling was used, it was replaced by a permanent restoration within 3 months.

13. The occlusion was checked with articulating paper to prevent pressure from the opposing tooth.

Criteria for Success

Pulp capping is evaluated in this paper from clinical and roentgenographic evidence.

A. Clinical Evidence:
   1. History of pain
   2. Tenderness to percussion
   3. Response to electric pulp tester.

B. Roentgenographic Evidence:
   1. Periapical findings
   2. Deposition of secondary dentin between the capping material and the pulp.

Patients were recalled at least every 6 months and subjected to clinical and roentgenographic tests. A number of patients possessing primary teeth about to be exfoliated provided material for histological evidence; this will be reported in a later paper. For a pulp capping to have been listed as clinically successful, the tooth must have given a negative history of pain, absence of tenderness to percussion, and a positive response to the electric pulp tester (Burton) in figures similar to adjacent, opposing, and analogous intact teeth. To have been regarded as a roentgenographic success, there must have been negative periapical radiographic findings and deposition of secondary dentin barrier between the pulp capping material and the pulp.

RESULTS

A. Clinical Evidence

Table I summarizes the clinical results of pulp capping with zinc oxide-eugenol and calcium hydroxide. Of a total of 135 pulp exposed teeth which were treated by pulp capping, 128 returned for checking. Of the 128, 116 were successful (90%) and 12 were unsuccessful (10%). Of the 65 teeth treated with calcium hydroxide, 60 (92%) were successful; of the 63 cases treated with zinc oxide-eugenol, 56 (89%) were successful. No primary tooth, treated by either calcium hydroxide or zinc oxide-eugenol, failed. Of the 54 permanent teeth treated with calcium hydroxide, 49 (91%) were successful; of the 51 permanent teeth treated with zinc oxide-eugenol, 44 (86%) were successful.

Table II summarizes the periods of serviceable retention of teeth after successful pulp capping. Of 12 primary teeth treated with zinc oxide-eugenol, 7 have been in place for a period of 1–1½ years,

3 from 1½–2 years, and 2 from 2½–3 years. Of 11 primary teeth treated with calcium hydroxide, 6 have been in place up to 6 months, 3 for a period of 6–12 months, and 2 for a period of 13–18 months. Of 44 permanent teeth treated with zinc oxide-eugenol, 9 have been in place for a period of 1–1½ years, 17 from 1½–2 years, 14 from 2–2½ years and 4 from 2½–3 years. Of 51 permanent teeth treated with calcium hydroxide, 19 have been in place up to 6 months, 25 for periods from 7–12 months, and 7 over a year.

Table III summarizes the age factor in successful cases.

TABLE I

Data on Teeth Treated by Pulp Capping

MATERIAL	SUCCESSFUL	UNSUCCESSFUL	DID NOT RETURN	TOTALS	% SUCCESS
Primary					
$Ca(OH)_2$.....	11	0	0	11	100
ZOE.....	12	0	2	14	100
	23	0	2	25	100
Permanent					
$Ca(OH)_2$.....	49	5	0	54	91
ZOE.....	44	7	5	56	86
	93	12	5	110	88
Primary and permanent					
$Ca(OH)_2$.....	60	5	0	65	92
ZOE.....	56	7	7	70	89
	116	12	7	135	90

TABLE II

Period of Serviceable Retention of Teeth After Pulp Capping

(Successful Cases)

MONTHS	PRIMARY		PERMANENT		TOTALS	
	ZOE	$Ca(OH)_2$	ZOE	$Ca(OH)_2$	ZOE	$Ca(OH)_2$
1–6		6		19		25
7–12		3		25		28
13–18	7	2	9	7	16	9
19–24	3		17		20	
25–30	2		14		16	
31–36			4		4	
	12	11	44	51	56	62

B. Roentgenographic Evidence

No exposure listed as clinically successful, whether treated by zinc oxide-eugenol or calcium hydroxide, showed any periapical radiographic finding.

TABLE III

Age Factor—Successful Cases

AGE RANGE OF PATIENTS AT DATE OF CAPPING	PERMANENT		PRIMARY	
	ZOE	$Ca(OH)_2$	ZOE	$Ca(OH)_2$
3–5			8	6
6–10	4	6	3	5
11–15	14	10	1	
16–20	13	7		
21–30	9	18		
31–40	3	3		
41–	1	7		
	44	51	12	11

The twelve unsuccessful cases showed no radiographic findings. The clinical case histories were identical: sudden onset of pain, swelling, throbbing, extrusion, and extreme sensitivity to percussion. Diagnosis in all unsuccessful cases was acute periapical abscess.

54 of the 56 (96%) exposures treated by zinc oxide-eugenol and listed as clinically successful showed no deposition of a secondary dentin barrier after 2 years.

Of the exposures treated by calcium hydroxide and listed as clinically successful, 33 of 60 (55%) showed a secondary dentin barrier after four months; 39 of 60 (65%) after six months. 8 of the 9

(89%) in place over a year showed this barrier.

DISCUSSION

The results presented in this paper were in substantial agreement with previous observation (8, 9) in confirming that mechanical and pathological exposures could be successfully pulp-capped.

The size of the exposure and prior history of sensitivity to hot or cold were not considered limiting factors.

The use of cotton rolls, rather than rubber dam, for cavity isolation simplified the operation and did not seem to affect the results adversely.

The removal of all caries was considered vital. To prevent its accidental incursion into the pulp, it was often necessary to excavate all pulpal caries first, place the capping material and thin cement, and then to complete the removal of caries from the walls of the cavity. The effect of phenol was not known at the outset of this study. As a result of later evidence (20), phenol has been eliminated from the procedure.

Thymol, suggested by a report by Day (21), has similarly been eliminated without ill effect. Current practice involves removal of debris with a cotton pellet moistened with zephiran (1/100).

In preventing excess pulpal pressure, there must be caution exercised in using hand instruments and burs as well as in placing the calcium hydroxide and the cement. While the thin mix of cement provides the pulp with a degree of protection from mechanical pressure, an additional layer of a slightly thicker-mixed cement was often required as an adequate thermal insulating barrier.

The failures recorded in this study seem to arise from three sources: those failing within a week were probably incorrectly diagnosed because the clinical criteria were not precise enough; those failing after several months possessed pulps which did not have sufficient recuperative powers and which in time degenerated; those failing after a year involved teeth in which additional caries or a dislodged restoration went untended. Additional research in criteria for selection of cases seems indicated.

SUMMARY

1. A criteria for selection of cases of pulp capping was suggested.

2. A procedure for capping exposed pulps, both pathological and mechanical was outlined.

3. Of 128 permanent and primary teeth treated for exposed pulps with either zinc oxide-eugenol or calcium hydroxide, 116 were clinically successful and in place from 5–39 months. The teeth treated with zinc oxide-eugenol showed an 89% success, those with calcium hydroxide a 92% success. Only 4% of the zinc oxide-eugenol group showed roentgenographically a secondary dentin barrier after 2 years, while 89% of the calcium hydroxide group showed this barrier within one year. This is a confirmation of histological studies (19, 20) which have previously shown that zinc oxide-eugenol treated pulps fail to deposit secondary dentin and a continuous odontoblastic layer, while those treated with calcium hydroxide showed this healing in four weeks.

4. Success in pulp capping was recorded from age 3 to 60.

5. It is recommended that a paste of calcium hydroxide and tap water be considered as a valid means of capping exposed, primary or permanent pulps which meet the criteria for case selection.

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The Restoration of Hypoplastic Young Anterior Teeth

LEIGH E. FADDEN, D.D.S.
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Editor's note:

Leigh Fadden has done a good job in the accompanying article to bring to our readers several suggestions for the restoration of the hypoplastic permanent anterior tooth, which is a matter of much concern to most of us. Our observation, when we had finished the article, was that of necessity at times, we must temper the operatively correct procedure with technics and conclusions governed by the patient's age and economic or social status (e.g. the use of the fast-curing acrylic resin materials).

A. E. S.

"Childhood," says Himler (1), "is the golden age for mental health." Psychiatrists agree that the emotional reactions of a child tend to become habitual and are carried into adult life. In spite of this knowledge, many children who are unfortunate enough to have unsightly, malformed, hypoplastic anterior teeth never secure dental treatment for their teeth. Thus, some children may carry into their later years basic feelings of inferiority and self-consciousness. The fault is not their own; it may be the fault of their parents. It should not be the fault of modern scientific dentists.

Some basic information is essential for scientific treatment. The clinical and microscopic appearance, and the etiology of hypoplasia are worth reviewing. The differences between mature and immature teeth and the relation of maturation to operative procedures provide other useful information. The problem, then, for the dentist is the esthetic restoration of individual teeth without endangering their vitality but perhaps improving their function.

In this paper the literature on this problem will be reviewed and technics of restoration will be appraised.

Hypoplasia

According to Thoma (2), dental hypoplasia is the result of developmental disturbances. These disorders may produce changes in the form of a tooth, or in the quantity and quality of the calcified tissues.

Kronfeld (3) states "Enamel hypoplasia is defective formation of the enamel of the deciduous or the permanent teeth. It is present in the unerupted tooth, becomes clinically recognizable upon eruption and persists throughout life."

Kronfeld (3) reports that the macroscopic appearance of hypoplastic enamel varies considerably. "In mild cases the enamel is intact except for several shallow depressions or grooves on otherwise smooth enamel surfaces. In more extensive cases, the grooves or pits are arranged in horizontal rows around the crown, extending into the enamel as far as the dentin-enamel junction. In severe cases, the enamel on the incisal edge of the incisors and cuspids is completely lacking, and the dentin on the occlusal surface of the first permanent molar is

exposed. The small amount of enamel present in such cases is distributed irregularly on the labial and lingual surfaces of the teeth."

The histological characteristics of enamel hypoplasia, according to Black (4), present one plan of departure from the normal arrangement of tissues. The differences between individual hypoplastic teeth are due only to position, the number of zones of injury and the details of severity. This plan is inseparably linked with the plan of development of the tissues. The zone of injury always follows the lines of Retzius, or incremental growth lines of the enamel. In hypoplastic teeth, there is an arrest or partial arrest of the growth of both enamel and dentin in the particular zone which was being developed at the time of the disturbance.

Kronfeld (3) says that from the chronology of the enamel formation of the permanent teeth, it is possible to estimate the age of the child at the time the disturbance occurred. Since the calcification of the permanent teeth begins at birth, hypoplasia of these teeth is always the result of a postnatal disturbance. Sarnat and Schour (5) report that less than two per cent of the enamel defects they studied occurred after the thirty-fourth month of life. This finding indicates that during the first year of life enamel formation is relatively easily disturbed.

The etiology of hypoplasia is still largely a matter of conjecture. Some of the probable causes are (6, 7):

1. Rickets
2. Congenital syphilis
3. Heredity
4. Mechanical trauma of a primary tooth
5. Pyogenic infection
6. Chemical poisoning of the ameloblasts
7. Lack of Vitamins A or D
8. Improper balance of the endocrine secretions
9. Gastro-intestinal disturbances
10. Exanthematous diseases.

Kronfeld (3) states that hypoplasia of the enamel is not an important etiological factor in dental caries. It is true, however, that hypoplastic teeth decay more rapidly than normal teeth, once the carious process has begun.

It is shown in the literature that variations exist in the size of the pulp chambers of hypoplastic teeth. Olson (8) reported a case with total absence of enamel on all the teeth. Radiographic examination of these teeth revealed the pulp chambers to be of normal size. Thoma (6) cites a case of hypoplasia in which the pulp canal in the tooth was practically obliterated. Clark (9) says, "In hypoplasias of the teeth and other abnormalities in which jacket crowns might be indicated, pulp recession may often be retarded when one would expect it to be advanced."

McBride (10) reports a personal communication with Bodecker which he received in answer to an inquiry regarding the high sensitivity of hypoplastic teeth to operative procedures. The answer he received was as follows: "The histologic picture is responsible for the observation you have made that hypoplastic young permanent teeth are highly sensitive. These teeth have a poorly calcified dentin containing much organic matter in their profuse interglobular spaces. This high content of organic matter transmits intense irritation to the pulp during cavity preparation. It has been my experience, however, that some ten or twenty years after the eruption of these teeth, many are less sensitive than the normal permanent teeth, due to maturing of the dentin."

Immature Teeth

There are several differences between immature and mature anterior teeth. The dentist should be cognizant of these variations before he initiates any operative procedures on young teeth. Bodecker (11) reports that the pulp chambers of immature teeth are somewhat larger than those of mature teeth because there is little, if any, secondary dentin present in young teeth. According to Easlick (12), the size of the pulp chambers in young teeth is often overestimated. The labio-lingual portions of these teeth usually present an adequate bulk of enamel and dentin; the mesial and distal hard tissues are somewhat thinner.

Bodecker (11) asserts that in recently erupted teeth, the dentin has not undergone a "protective metamorphosis." In this process, the lymph in the dentinal tubules is replaced by calcified deposits of mineral salts. This blocking of the tubules is brought about by a chronologic maturing of the teeth, and also by the formation of secondary dentin by attrition. Because of this lack of calcification, young pulps are frequently harmed by heat, irritation, and chemicals. The use of water and air on the revolving instrument will aid in preventing heat. The use of varnish on the open dentinal tubules will tend to prevent pulp irritation from pressure and the chemical effects of a cementing material.

In an article concerning porcelain veneer crown technic, Hagen (13) says, "Although it is practical and desirable at all age levels to have roentgenograms of the involved teeth, it is imperative for young persons. A minimum of two roentgenograms is recommended, one a standard type showing the entire tooth and its surrounding structures and the other limited to the coronal area only." For the coronal picture, he recommends that the film be placed approximately 3 mm. above the linguogingival enamel, and the exposure should be taken straight through the crown portion of the tooth. This technic allows one to obtain an accurate picture of the pulp and its extensions.

According to Kronfeld (14) it may be said that in youth the clinical crown, that portion of a tooth which is actually erupted, is smaller than the anatomic crown, that portion of the tooth which is covered by enamel. Bodecker (15) reports that the epithelial attachment serves as a barrier to the penetration of infection. If a cleft or wound occurs which exposes the underlying dermis, bacteria can penetrate unless they are combatted by a natural resistance of the tissues. Tylman (16) states that in young patients, the presence of a high epithelial attachment and the absence of a gingival crevice contraindicates the removal of the enamel below the crest of the gingiva.

Restorations for Hypoplastic Young Anterior Teeth

Black (4) says, "Incisor teeth that are so malformed as to be very unsightly in appearance, should not be treated hurriedly. They should be tided along until the time when porcelain jackets can be made." He advises the rendering of only temporary treatment until the patient is eighteen to twenty years old. Bodecker (11) indicates that persons under thirty years of age are "poor risks" for porcelain jacket crowns.

According to Schultz (18), porcelain jacket crowns are indicated to restore unsightly anterior teeth:

1. If the dentin of the tooth to be restored simulates the normal dentin core of a tooth in that position
2. If the occlusion is normal
3. If there are no abnormal extensions of the pulp organ

4. If the posterior teeth are present
5. If the color of adjacent teeth can be duplicated.

It is claimed by Both (19), that the shoulderless type of preparation should be made on a tooth when it is so narrow at its cervical diameter that the vitality of the pulp may be endangered by cutting a shoulder. LeGro (20) wrote that the shoulderless type of crown is most decidedly indicated for children under 16 years of age. Cohen (21) says, "The shoulder, no matter how narrow it be, lends support to the jacket and assists in taking up the stress of mastication. The shoulder is a butt joint that is less apt to cause subsequent pathology than the overhanging lap joint of the shoulderless crown." Felcher (22) reports that teeth which are properly prepared for jacket crowns always have a shoulder.

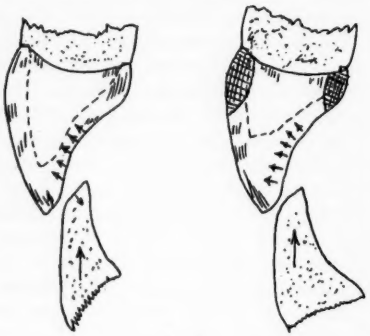


FIG. 1.

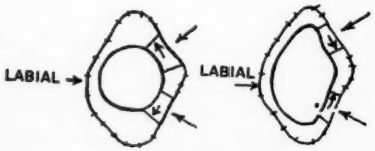


FIG. 2. (After Tylman)

Burwell and Slack (23, 24) have suggested the use of acrylic jacket crowns for the restoration of anterior teeth. It has been reported by Tylman and Peyton (25) that acrylic resin is too soft to withstand masticatory pressures, flows under pressure, has a five per cent dimensional change because of the absorption of water, softens in temperatures which frequently exist in the mouth, and has a thermal expansion approximately twenty times as great as porcelain.

"Porcelain," says Clark (9), "is an excellent non-conductor in the presence of thermal changes and similar stimuli that are often irritating to the pulp." Tylman (16) states that fused porcelain is friable and susceptible to fracture much more so than restorations made of gold alloys. However, if porcelain is placed so that it is supported properly by underlying tooth structure, it is capable of withstanding enormous stresses. He believes that in the centrals, laterals, and cuspids the preparation should be sufficiently long to eliminate crescent shaped fractures at the gingival (Fig. 1). It is also necessary that the mesio-distal width of the preparation be sufficient to prevent fracture from torsional strains (Fig. 2).

Grubb (26), discussing the preparation for a jacket crown, stated that the prepared tooth that will give the maximum strength and support to a porcelain jacket crown will conform closely in outline to the natural form of the dentin. Its proximal areas will be almost parallel, the variations from the parallel being sufficient only to permit the removal of the impression without distortion.

Aecording to Bastian (27), "The potential breakage of the porcelain jacket cannot be ignored. This hazard can be reduced by attention to technical details, such as the correct preparation of the natural tooth, the avoidance of over-

strain in the bite, both centric and functional, the use of high-fusing porcelain and proper care in the handling of the porcelain. Thus the porcelain should be thoroughly condensed in building it up. It should not be overglazed in biscuiting or overfused in glazing, after which it should be allowed to cool slowly."

Schultz reports that diamond instruments are the instruments of choice for the jacket crown preparation. They should be kept moist with room temperature water, used with light pressure, and revolved at a speed of 7000 r.p.m. or faster. He suggests that before the labial or lingual enamel is removed, a network of grooves should be made with a small diamond, rounded-edge wheel. These grooves should extend through the enamel to the dentino-enamel junction where they will act as "stops" when the enamel is subsequently removed.

Schultz recommends that the shoulder should be initially prepared at the level of the gingival crest. He asserts that it should later be carried to one-half the depth of the gingival crevice by the use of a diamond, shoulder-forming instrument of medium size. He suggests a width of $\frac{3}{4}$ mm. for a shoulder in young anterior teeth.

Clark (9) reports that it is a good plan to explore the gingival crest with a flat, blunt instrument to determine its depth at different points. These findings will serve as a guide in preparing the gingival shoulder.

Grubb (26) states, "The minimum width of proximal shoulder (very narrow) permits a greater mesio-distal dimension, which means less overhanging, unsupported wings of porcelain. The conservation of dentin gives better protection to the pulp and more strength to the prepared tooth."

Oppice advises that the angle of the shoulder may be determined very simply. It is known that the resistance to fracture or dislodgment is best obtained from surfaces which are at right angles to the applied force. "Those surfaces which are at right angles to the attritional forces must offer a resistance that will prevent the fracture or dislodgment of the artificial crown. Therefore, the shoulder of the jacket crown preparation together with the incisal or occlusal surfaces should be in planes which are at right angles to the forces of mastication. Since the axial surfaces of the dentinal preparation are parallel to the forces exerted during mastication, the shoulder should be at right angles to the axial surfaces."

Schultz recommends the use of Bastian files to polish the shoulder. This operation gives the shoulder a "roof-like" taper which aids in the retention of the crown and tends to remove unsupported enamel rods. He states that a polished porcelain jacket is often superior esthetically to one with a highly glazed surface. After the glaze is removed with a carborundum stone, the jacket is polished with an extra-fine Craytex wheel and buffed with levigated alumina on a polishing wheel. The desired degree of luster can then be obtained. Translucent cements are not satisfactory for use in the cementation of porcelain jacket crowns. Schultz reports that they tend to discolor and cause a bluish-grey discoloration of a porcelain crown. He recommends the use of the correct shade of zinc orthophosphate cement.

Clark (9) reports that when the porcelain jacket crown occludes with the natural teeth or other porcelain teeth, the glaze should be removed from the chewing surface in order to facilitate occlusal wear. When the jacket occludes with gold, the polish should be left intact and thus

excessive wear of the softer gold surface is prevented.

Ellis (29) reports that a three-quarter crown restoration with a silicate cement, acrylic, or fused porcelain veneer may be used to restore young anterior teeth. He suggests the use of a "semi-three-quarter inlay with accessory pin anchorage." The preparation for this restoration is not extensive and must be made "with due respect for the young pulp and dentin." The mesial and distal slices should not be deeper than the thickness of enamel. The accessory pin anchorage is provided for at two points; in the mesial and distal portions of the incisal third of the lingual surface. Provision is made for the labial veneer in the wax carving of the crown. The finished inlay is cemented to place, if a baked porcelain or silicate cement veneer is to be used. If an acrylic veneer is to be used, the crown is not cemented until the veneer has been processed. The veneer must have moderate bulk in order to prevent the gold from influencing the final color of the crown.

According to Schultz, young hypoplastic anterior teeth that cannot be treated with porcelain jacket crowns can usually be successfully restored with gold veneer crowns which have a labial facing of baked porcelain, ground porcelain, or acrylic resin. The mesial, distal, and lingual surfaces of the tooth are prepared as they would be for a three-quarter crown preparation. The labial surface is prepared as it would be for a porcelain jacket crown preparation. The shoulder on the labial surface should be approximately 1 mm. wide, perpendicular to the labio-axial surface, and decreased in width as it is carried into the mesial and distal embrasures. The shoulder is then beveled with a 242 R.A. bur to give added retention and to allow better adaptation of the restoration to the tissues. A mesial and distal retentive groove should be prepared with a R.A. 700 bur when it is possible to do so without endangering the pulp organ. After the lingual enamel is stoned out of occlusion, a finishing line is made at the crest of the lingual gingiva. This line is extended to meet the shoulder in the mesial and distal embrasures. A pin-hole is prepared in the cingulum with a ½ R.A. bur, and it is subsequently tapered with a 700 R.A. bur. The mesial and distal grooves and the pin-hole in the cingulum should be prepared parallel to a plane through the long axis of the tooth. The enamel is removed from the incisal edge of the tooth to allow a thickness of gold in this area.

The crown is made by the indirect technic. A seamless copper band is carefully contoured to the gingival outline of the preparation. The impression is taken with Moyer low-heat compound, and a copper-plated or amalgam die is then made.

If a ground porcelain facing is to be used, a porcelain tooth is carefully adapted to the labial surface of the die. A fin of porcelain should be left on the mesial and distal surfaces of the facing. These fins will be grooved vertically before the facing is cemented to the crown, and they will tend to aid in the retention of the facing.

A wax pin is placed in the pin-hole and the crown is waxed with the facing in place. A medium hard gold is suggested for the casting. The margins of gold which will contact the porcelain facing are not polished until the facing is cemented. They are then "spun" into the surface of the adjoining porcelain with a Gem stone.

The baked porcelain labial veneer is indicated when it is difficult to adapt a porcelain tooth to the labial surface of

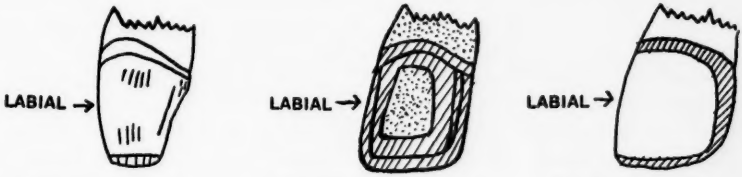
the preparation; a tooth which is rotated or otherwise out of normal position. When the baked veneer is to be used, the com-

FIG. 3. (Cross-section of the porcelain facing)

plete crown is carved in wax. A labial window is then prepared for the porcelain facing in the wax crown. The retention of the porcelain facing is aided by two platinum pins which are placed in the porcelain when it is baked. The holes in the crown which are to receive these pins are prepared at the time the crown is carved in wax.

An acrylic resin labial veneer can be used in this type of restoration. After the wax crown is carved, the labial wax is removed to allow sufficient space for a bulk of resin. Deep undercuts are prepared for the resin and two holes are made in the wax crown, close to the mesio-incisal and disto-incisal angles. These holes will later allow light to penetrate through the incisal portion of the acrylic resin, and a translucency will be effected at the incisal edge of the crown.

According to Vehe (30), the partial veneer porcelain is indicated for restoring the incisal portions of the teeth in very young patients or when it is especially desirable to avoid any undue irritation to the pulp. The preparation of the tooth for this crown is made by removing the enamel on all surfaces, as far as it is necessary, to get to sound tooth structure. The shoulder should meet the surface at a right angle at every point. A sufficient amount of enamel should be removed from the incisal end of the tooth to provide a bulk of porcelain at right angles to the direction of the opposing forces.



Tooth prepared for a porcelain-faced gold veneer crown

Wax crown in place on the die

Porcelain crown in place on the tooth

FIG. 4

DISCUSSION AND EVALUATION OF RESTORATIVE TECHNICS

It is true that those hypoplastic young anterior teeth which have abnormal extensions of the pulp into the hard tissues should not be crowned. It does not seem logical, however, to recommend that a child must attain a specific age before any hypoplastic teeth can be permanently restored. The clinical and radiographic evidence should be the criteria in determining treatment of these teeth.

The porcelain jacket crown is an ideal restoration for many young hypoplastic anterior teeth. The shoulderless veneer crown is definitely contraindicated be-

cause it is unsupported in the gingival region and thus, there is not an adequate absorption of the stresses of mastication. Also, the overlapping joint of the shoulderless jacket may frequently cause irritation of the soft tissues and subsequent pathosis.

The preparation of a tooth for a porcelain jacket crown should be completed with an extreme amount of care. All revolving instruments should be kept moistened with water to prevent any excessive production of heat in the preparation of the tooth.

As suggested by Grubb and Schultz, the preparation should simulate the tooth's normal core of dentin. This form will give to the porcelain jacket a maximum of support, and the pulp will receive a maximum of protection.

Before the shoulder is prepared, the gingival crevice, if it is present, should be explored. If the shoulder is prepared at right angles to the forces acting on the tooth, a maximum resistance to fracture and dislodgement is achieved. It would seem that an attempt to file the shoulder to a "roof-like" taper might be very difficult and unnecessary on the comparatively narrow shoulder which would be prepared on a young tooth. The retention of the crown would be adequate if the crown were made properly, and the shoulder at right angles to masticatory forces would tend to be parallel to the enamel rods in the cervical area. The shoulder prepared at a level, one-half the depth of the gingival crevice, as suggested by Schultz, would tend to be ideal. A cement line would not be exposed on the labial surface and the epithelial attachment would not be damaged.

The proper handling of the porcelain should be stressed. A high fusing porcelain possessing the maximum strength should be used, and it should be well condensed, properly baked, and allowed to cool slowly. The risk of a future fracture would thus be greatly minimized.

Porcelain jackets are often inferior because they reflect light to a greater degree than the adjacent teeth. This condition may be corrected by removing the glaze and polishing the porcelain surface.

The Brinell hardness number of porcelain is almost twice that of tooth enamel (31). Therefore, it is necessary to remove the glaze from the porcelain surface which occludes with the natural teeth. Trauma is thus minimized by the abrasion which is effected. It would also be helpful to check the occlusion of a jacketed tooth periodically, as the roughened porcelain surface will tend to become polished by the comminution of food.

An acrylic jacket crown certainly cannot be considered an adequate restoration for young permanent teeth. The many weaknesses of acrylic resin have been discussed. The inability of the material to withstand the stresses of mastication is, in itself, sufficient reason to contraindicate its use.

The gold veneer crown with a porcelain facing would seem to be indicated for many teeth which cannot be restored with a porcelain jacket crown. It is indicated for hypoplastic young anterior teeth:

1. Which are so malformed that the dentin does not simulate the normal dentin core of a tooth in that position
2. Which are not in normal occlusion
3. When some of the posterior teeth are missing
4. Which have extensions of the pulp chambers abnormally close to the mesial, distal, or lingual surfaces of the teeth
5. When radiographs show that some of the posterior teeth may soon require extraction
6. When the child is active in athletic

activity that may cause a fracture of a porcelain jacket crown.

There are many variations of the restoration. The silicate cement veneer is not satisfactory because silicate cements are soluble and disintegrate in the mouth fluids (32). Silicate cement is also relatively soft and it tends to discolor. A veneer of acrylic resin would not be satisfactory because it tends to flow under pressure, soften at high temperatures, change dimension when it absorbs water, and lacks surface hardness. The ground porcelain or baked porcelain labial veneer would seem to be the most satisfactory.

The tooth should be prepared, if possible, with mesial and distal grooves, and also a pin-hole in the cingulum of the tooth. If the grooves cannot be prepared because of a deficiency of tooth structure, it is probable that their omission would not sacrifice the retentive quality of the restoration.

If it is prepared correctly, there should be little, if any, gold visible on the labial surface. Its preparation does not require the removal of as much tooth structure as a porcelain jacket crown preparation, and it should be less subject to fracture than the porcelain jacket.

It would seem that the partial porcelain veneer crown is not indicated for the restoration of hypoplastic young anterior teeth. This restoration would be inferior in esthetics because of the horizontal line of juncture which completely surrounds the tooth.

Summary

The literature on hypoplasia and the operative significance of immaturity of teeth have been scanned. The literature on the restorative technics for young hypoplastic anterior teeth has been reviewed and then appraised.

Conclusions

1. Most hypoplastic young anterior teeth can be restored successfully.

2. An extreme amount of care should be exercised in operating on these teeth.

3. Each case should be treated individually, using clinical and radiographic findings as criteria in determining the treatment.

4. The porcelain jacket crown can be used to restore many cases of hypoplastic young anterior teeth.

5. The gold veneer crown with a labial porcelain facing can be used to restore most of those cases that cannot be treated successfully with the porcelain jacket crown.

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Around the Country

Items of interest for this column should be sent to Dr. Laren Teutsch, Editor, 4201 Farnam St., Omaha 3, Nebraska.

Your new column editor was a little handicapped in getting the news in to Editor Al Seyler this time. Since it wasn't definite whether or not the column would be continued, there weren't many news items sent in. I'm sure we all like to keep up on the personal and business news about our fellow dentists, so let's have a big response for the next issue. If you don't have any news about yourself, send in some about someone else—please do! Thanks. L. W. T.

Tennessee

A.S.D.C.ers from Tennessee who attended the Southern Branch A.P.H.A. meeting in Biloxi, Mississippi and enjoyed the Gulf Coast resort atmosphere were Benjamin Gunter, Chester Lloyd, and A. H. Trithart. Dr. Polly Ayers was in charge of the Dental Section Program and did a bang-up job. A. H. Trithart was re-elected Secretary of the Section.

* * *

Dr. Earl Crumpton has moved to Knoxville and is devoting his practice to pedodontics exclusively.

* * *

Dr. Kimbrough Boren and Dr. R. Parker Graham are now on active duty with the Army Air Force and Dr. Hubert J. Bell has recently been called to active duty by the Army Dental Corps.

* * *

Dr. Frank Hall completed his term of office as President of the Tennessee State Dental Association and was succeeded by Dr. O. M. Jamieson.

* * *

A.S.D.C.er Carl L. Sebelius recently completed a three-month tour of the Scandinavian countries for the W.H.O. of the U.N. Carl did many dental examinations and his findings will reveal many interesting things about dentistry in Norway, Sweden and Denmark. We'd all like to hear more about your trip, Carl!

Michigan

W. E. Brown, Jr. addressed the Hygienists Association at the Michigan State Meeting in Detroit in April. In May, after lecturing to the University of Detroit undergraduate class in Pedodontics for Al Seyler, he settled down to some hard work around his new house.

* * *

Milton Panzer has been appointed Director of the Dental Division of the Mott Foundation in Flint, Michigan. Dr. Panzer is a former graduate student at the University of Michigan.

* * *

Paul Taylor, another U. of M. graduate student, has left the Mott Foundation to become a very fine private practitioner of Pedodontics in Dallas, Texas.

* * *

The present graduate class, Drs. Castro, Konikow, Fadden, Lindahl, Nolla, Rees and Uribe presented seven good table clinics April 18 at the Michigan State Dental Society Meeting.

* * *

Dr. Kenneth A. Easlick was chairman of a committee which developed an out-

standing set of teaching objectives for Pedodontics which was presented at the French Lick Teachers' Meeting. Ken has prepared a wonderful workshop program for the appraisal of present scientific information concerning Periodontal disease to be held at the University of Michigan, September 10 through 15. It will be an outstanding project with a large visiting faculty. Ken is planning for a long flight and a lecture on Pedodontics in Chile, South America for this fall and will serve as moderator in a Symposium on "Modern Dental Caries Control Measures" at the American Academy of Pedodontics Meeting in Minneapolis, Minnesota.

* * *

Dr. E. T. A. Coughlin completed his graduate work in June and has established his office at Kalamazoo, Michigan.

* * *

Joe Hartsook, who was recently appointed a Special Consultant for the U. S. Public Health Service Dental Division, spent three months this Summer in Mexico, participating in an extension course in pedodontics.

Nebraska

We can devote a long paragraph to anyone as busy as Ralph Ireland. The last of January Ralph flew to San Juan, Puerto Rico as guest of the Puertican Dental Society. He stayed there for several days and appeared on their program many times. On his return, he stopped off at the Chicago meeting and then went to St. Louis for the American Board of Pedodontics examination. Shortly after that Ralph appeared on the Massachusetts State Dental Society's program and also spoke to our Mass. Unit.

Dr. A. A. Kubat finished a successful first year as Instructor of Pedodontics at Creighton University. Lou also practices part time in the enlarged offices of Laren Teutsch. Lou is well known in the state for his fine ball playing and also for his singing. Ask any of the Zips who heard him at the State meeting!

* * *

Ed Hibbard received his M.S. degree in Pedodontics from the University of Nebraska in June and is now teaching part time at the school and practicing part time in Earl Lampshire's newly decorated office. Incidentally, Ed became engaged to a lovely girl last May. Congratulations.

* * *

President-Elect Earl Lampshire keeps very busy these days. Last Spring Earl talked in Sioux City, Iowa on "Modern Trends and Technics in Dentistry for Children." One of Earl's big jobs was that of being Chairman of Nebraska's Health Services Committee of the Mid Century White House Conference on Children and Youth.

* * *

Creighton University Department of Pedodontics selected Norman Olsen and Wm. Shawler as first and second award winners of the American Society of Dentistry for Children. The University of Nebraska Department of Pedodontics selected Ward C. Newcomb and Thomas Drangsholt as their award winners. Congratulations, Doctors, and welcome to our society. Incidentally, Norman Olsen is now in Graduate School at Northwestern under George Teuscher.

* * *

The American Society of Dentistry for Children is well represented in the Omaha District Dental Society. The three new officers (all A.S.D.C.ers) are: President, E. Dexter Henry, President-

Elect, Merlin Spain, and Secretary Treasurer, Laren Teutsch.

* * *

Sidney Kohn of Jersey City was a featured speaker at the meeting of The American Academy of Dental Medicine, held at Atlantic City in June. The trip served as sort of a "breather week-end" for Sid and his family.

* * *

Sam Stulberg of our Michigan Unit plans to move into his new office building in Northeast Detroit around the 1st of October.

* * *

Joe Cabot, Walter Weisz and Sam Harris were amazed at Joe Cohen's (Minneapolis) conducted tour of the St. Paul-Minneapolis area. Joe found new streets to explore, people to question and sights to point out as he took the boys to the airport after the Academy meeting, and when he finally set the boys down at the 'port, he seemed pretty well relieved —as were his passengers!!

* * *

Around the country go the meetings of the American Academy of Pedodontics, and this June, 1951 found the meeting at Minneapolis with Harold Wittich as host. Academy members and their guests gathered to hear prominent research men, teachers and practitioners discuss dentistry for children.

* * *

Seattle, some 2000 miles to the West, was represented by David Law, Virgil Cheyne and Walter Smith. There are, so they say, 8 practitioners of Pedodontics now in Seattle.

* * *

Pedodontics is really growing fast! Sam Harris, President of Dale Carnegie International, didn't know that there are 25 practitioners of pedodontics in the Southwest section of this country, including such prominent personalities as Sumner Russman, Oklahoma City, Ben Kletzky of Denver, and Wayne Rose from Wichita, Kansas, all present at the Academy meeting.

* * *

It's the up-in-my-room sessions that go on into the wee hours of the morning where you pick up that single point to take back home to make a meeting successful! Ben Rabinowitch, Los Angeles, "just happened to bring along" some slides on his pulpectomy technic for the primary molars, and many of the fellows wanted to see them. George Teuscher, Walter Weisz, Joe Cabot, Ray Werther, Wayne Rose, Sumner Russman and Sam Stulberg all were very much interested in Ben's story, but all too often it reminded each listener of a story that had to interrupt Ben's interesting research. Harold Addelston's description and comments on "Fluid Acrylic" technic were truly a high spot.

* * *

Doctors Armstrong, Radusch and Bierman gave fine presentations on modern dental caries control technics. This was summarized most excellently by Ken Easlick. Joe Cohen's presentation of his operative dental treatment for children with general anesthesia was enjoyed by all.

* * *

The Academy Meeting has its pretty ladies, too! Mary Lynn Morgan, Elsie Gerlach, Mary Martin, Cornelia Thompson, Ruth Martin, Elsie Schildwachter and Molly Foster all graced our gatherings.

* * *

Your column editor enjoyed attending the fourth annual meeting of the Academy as Al Seyler's guest.

* * *

Dave Law, Ben Rabinowitch, Charlie Sweet, Floyd Hogeboom and Alex Bell

participated in the program of the Pacific Coast Dental Conference. Dave Law took the group out on his crusier—nobody fell in—not even Alex Bell!

* * *

John Brauer of Chapel Hill keeps good men at his fingertips! Willie Demeritt of Los Angeles is to join John at Chapel Hill, taking over the Pedodontic department.

* * *

Maury Massler is back gathering more information in Europe. He is making studies in Germany, similar to those he made in Italy three years ago.

* * *

George Wood, of Spokane, presented a paper at the Pacific Coast Conference but left to attend the Academy meeting. George took his pedodontic training at Southern California. His father, a physician, is now a United States Congressman from Idaho, always interested in legislation for the medical and dental professions.

* * *

Ye Ed had a note recently from Al Anderson, formerly of California, now a member of the U.S.P.H.S. stationed at beautiful Woonsocket, Rhode Island. Al is almost ready to admit that R.I. has it all over California—Northern, that is!!

Recipients of the A.S.D.C. awards for 1951 in the State of Michigan were Leo Shipko and Marvin Revzin at the University of Detroit and Milton Superstine and Hernando de Castro at Ann Arbor. Congratulations to these young men—and may their interest in pedodontics become increasingly greater!

* * *

Tufts College Dental School announces that courses in oral pediatrics listed below will be presented throughout the academic year of 1951 and 1952. Information may be obtained by directing correspondence to the Director of the Division of Graduate and Postgraduate Studies, Tufts College Dental School, 136 Harrison Avenue, Boston 11, Mass.

Pedodontia: each Friday for the ten weeks from Oct. 5 to Dec. 14, 1951, plus two optional days on Jan. 4 and Jan. 11. Feb. 1 to April 18, 1952, plus two optional days on April 25 and May 2; tuition $150.00; Dr. Frederick Shiere and Staff.

Pedodontia: Dec. 3 to 7th, 1951; tuition $100.00; Dr. Frederick Shiere and Staff.

Pedodontia: June 9 to June 21, 1952; tuition $150.00; Dr. Frederick Shiere and Staff.

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Preventive Orthodontics and the Dental Health Program

IRVING GRENADIER, B.S., D.D.S.
Bronx, N. Y.

Editor's note:

Irving Grenadier is a graduate of N.Y.U. College of Dentistry, 1935, who now practices orthodontics in New York City. He is chairman-elect of the Oral Hygiene Committee of Greater New York, Director of Orthodontics, Bronx division of Community Service Society of New York, staff member of Bronx and Lebanon Hospitals, and according to Harold Klein, a mighty busy and capable fellow who gets jobs done.

Although this article presents no new facts, it does serve to recall to you one of most important responsibilities of the general practitioner who cares for children.

A. E. S.

In February 1951, organized dentistry in New York State launched the most intensive campaign of Public Health Education in its history. This program is effectively designed to spread the gospel of good dental care for the children of our community. In the metropolitan area, The Oral Hygiene Committee of Greater New York, with the help of many cooperating groups, utilized every means of communication in existence today, in a tremendous attempt to raise the dental health level of the children in our City.

With the importance of the Children's Dental Health program some thought should be given to the Orthodontic phase; particularly as it is related to the role of the general practitioner of dentistry. The family dentist, whether or not he includes the treatment of malocclusion in his practice, is expected by parents to advise them properly regarding the orthodontic needs of their children.

Much has been said and written in recent years regarding caries control and prevention, and in this era of broadened public health education, the demand for the prevention of many medical and dental ills has progressed to the stage where preventive treatment of incipient malocclusion lies well within the scope of the general practitioner of dentistry. It is interesting to note that at least one third of the child population suffers from preventable dento-facial abnormalities. The average child that reachs the orthodontist, as a general rule, is well beyond the point at which preventive measures alone will be adequate.

The dentist must therefore be able to differentiate, at least as far as the dentition is concerned, between the individual normal and abnormal. He must adopt a dynamic approach and acquire a greater orthodontic awareness in order to intelligently evaluate the ever changing mouth and jaws in relation to the child as a whole. He must take into account, when examining his child patient, the sum total of growth and development, the normal and its deviations with regards to the maxillomandibular relationship, the face and the occlusion, as well as the physical state of the dentition itself. In brief, the dentist should know whether or not the child

requires orthodontic attention, irrespective of the fact that he may or may not be prepared to classify and treat the malocclusion himself.

Prophylactic orthodontic treatment is concerned primarily with the control of environmental factors which influence the development of the dentition. It entails the elimination of local habits which interfere with the normal growth, development and function of the dento-facial structures, such as thumb sucking, lip biting and nail biting. It involves also the maintenance of tooth form by proper restoration of individual teeth, the timely removal of overretained primary teeth, depending on the degree of root development and the position of the permanent successors; the use of space retainers after premature loss of primary molars, and the correction of general contributory causes.

While the premature loss of primary teeth does not always result in a malocclusion of the permanent teeth, there have been too many instances in which the first permanent molar has drifted mesially, with the resultant impaction of the permanent second bicuspid. For this reason early loss of primary molars and cuspids should be followed by the use of space retainers, particularly if there is bone overlying the permanent successor, and if periodic measurement indicates that the space is being eliminated by the shifting of adjacent teeth. Premature loss of primary teeth is probably the most frequent cause of orthodontic involvement.

No mechanical space retainer can be as completely satisfactory as a normal primary tooth. However space retainers should meet the following conditions if they are to be really effective:

1. Maintenance of the desired mesio-distal dimension of the space.

2. They should not be allowed to interfere with the erupting tooth, and must be removed as soon as the occlusal surface of the permanent successor is no longer covered by bone.

3. They should not interfere with the normal growth of the alveolar process.

4. The individual functional movement of the anchor teeth must be maintained.

Pernicious habits such as thumb sucking involve the dento-facial area and frequently interfere with normal growth, development and function, and constitute a preventable cause of malocclusion. Such habits are especially amenable to early correction, and if they are eliminated by the fifth year of life, the typical malocclusion induced by thumb-sucking is generally self corrected. While it is true that not every instance of thumb or finger sucking will result in a protrusion of the maxillary anterior teeth, the accompanying deformity occurs in a sufficiently high percentage of cases to warrant breaking the habit as early as possible.

The breaking of these habits calls for complete co-operation and persistence on the part of the parent, since they are usually indulged in during the sleeping hours. A definite program of correction must be undertaken, and it must be rigidly adhered to. There are many different methods which can be employed. The drawstrings of the night gown sleeve may be tied tightly, with the hand up inside the sleeve. If the child does not like the feeling of the cloth in its mouth, this may be all that is necessary. Or, the bare fingers may be painted with harmless, bitter substances, the taste of which discourages sucking. It must be an all out effort regardless of the rebellion of the youngster during the first few nights. There are also other steps which can be

taken, some of which involve the use of mechanical appliances which are designed to make the sucking habit extremely uncomfortable. As stated previously if such a habit can be broken before the age of five years, the teeth will frequently return to a normal position.

The employment of preventive orthodontic measures in the general practice of dentistry will accomplish the following desirable objectives:

1. Allow proper masticatory function.
2. Reduce susceptibility to, and the incidence of, dental caries.
3. Prevent abnormalities of facial appearance where they are of dental origin.
4. Avoid extensive orthodontic treatment at a later age.
5. Avoid future development of periodontal conditions.
6. Prevent development of improper mental and psychological attitudes which might arise from marked dento-facial abnormalities.
7. Aid in avoidance of speech defects.

SUMMARY

The dentist who is fully cognizant of the value of prophylactic orthodontics and conducts his practice accordingly, can do much to raise the dental health level of the community and reduce the incidence of malocclusion. His work will consist chiefly of the following:

1. The prevention of tooth decay in the light of the present day knowledge.
2. The restoration of decayed areas in the primary and permanent teeth, with a view to restoring form and proper function so that balanced occlusion and healthy periodontium will be maintained.
3. Employment of such preventive aids as space retainers and correction of harmful habits, in order to promote and maintain normal occlusion.
4. Controlling the loss of primary teeth in accordance with the normal growth and development of the individual child.
5. Reference to the orthodontist of cases showing obvious occlusal disharmonies, preferably in their incipiency.

888 Grand Concourse

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President's Message

Urgent"

Those interested in Dentistry for Children received a shocking scare when we learned, after the program had already started, of the training of "Dental Nurses to do the SIMPLE dentistry needed by school age children," at Forsythe Infirmary.

We (A.S.D.C.) believe American children were well served when, through the combined efforts of the A.D.A., the Massachusetts State Dental Association, and the A.S.D.C., this quality degrading program was abandoned.

Now we hear that the British Health Service, having created an impossible situation through commitments to supply care beyond the capacity of the dental profession, has voted to start a "New Zealand type" service.

To those advocating a lowering of standards in this country this move may supply impetus to work again and harder here. We can be sure that we are not kept informed of all the plans and there may be subversive activities now in progress.

Every member of the A.D.A. must support better programs in Dentistry for Children by serving child patients and supporting organizations such as the American Society of Dentistry for Children and the American Society of Orthodontists. Should dental services be divided and sub-level personnel used to treat children, other divisions are sure to follow. Few dentists could or would care to practice if they had to compete with trade-level personnel in providing services.

The A.S.D.C. must increase its efforts to enlarge its membership and to sponsor all programs which aim at providing better dental health for our children through the prevention and treatment of dental disease.

HUGO M. KULSTAD